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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/561,476

04/18/2007

Brian Dam Pedersen

GNR P507 PCT US

8201

86107

7590

10/08/2009

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EXAMINER

ROBINSON, RYAN C

ART UNIT

PAPER NUMBER

2614

MAIL DATE

DELIVERY MODE

10/08/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/561,476	<b>Applicant(s)</b> PEDERSEN, BRIAN DAM	
	<b>Examiner</b> RYAN C. ROBINSON	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 9-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 9-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/21/2005; 6/9/2006</u>                                      | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Denmark on 6/24/2003. It is noted, however, that applicant has not filed a certified copy of the Danish application as required by 35 U.S.C. 119(b).

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1 and 9-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baechler, U.S. Patent No. 6,768,802, filed on 11/1/1999, (hereby Baechler), in view of Allegro, U.S. Patent No. 7,158,931, filed on 1/28/2002, (hereby Allegro).**

4. As to claim 1, Baechler discloses a binaural hearing aid system (Figs 1-3) comprising a first hearing aid (1a) and a second hearing aid (1b), each of which comprising a microphone (3a, 3b), a processor (5a, 5b) that is configured to process the input signal in accordance with a predetermined signal processing algorithm to generate

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a processed output signal, and an output transducer (7a, 7b) for conversion of the respective processed output signal to an acoustic output signal, and a binaural sound environment detector (23, 20, 25) for binaural determination of the sound environment, the binaural sound environment detector comprising, an environment classifier (23) for categorizing the sound environment based at least in part on the determined characteristic parameters, and a parameter map (20) for provision of an output for a selection of the signal processing algorithm, each of the parameter maps of the first and second hearing aid is configured to receive a first output from the environment classifier (23) of the first hearing aid and a second output from the environment classifier of the second hearing aid (The hearing aid classifier output in the second hearing aid is received via 27, and is represented by 25), and generate the output for the selection of the signal processing algorithm.

It is noted that Baechler does not explicitly disclose an A/D converter for provision of a digital input signal in response to sound signals received at the respective microphone in a sound environment surrounding a user of the binaural hearing aid system as well as a D/A converter. Baechler is silent as to whether or not the system is digital or analog. Examiner takes official notice that an A/D and a D/A converter would have been necessary to implement signal processing as taught by Baechler on a digital system. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention to provide both an A/D and D/A converters in the hearing aid system taught by Baechler.

It is also noted that Baechler does not explicitly teach that the sound environment detector has a feature extractor for determination of characteristic parameters of the received sound signals. However, using a feature extractor would have been well known in the art. Allegro teaches a sound environment detector (Fig. 1) utilizing a feature extractor (F) for determination of characteristic parameters of the received sound signals. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of Applicant's invention to provide a feature extractor in the hearing aid system disclosed by Baechler, to provide a robust and precise classification of the sound environment (Allegro: Col. 2, lines 16-18).

5. As to claim 9, Baechler and Allegro remain as applied above. Baechler further discloses that the first output corresponds with an environment classification determined by the environment classifier of the first hearing aid (1a), and the second output corresponds with an environment classification determined by the environment classifier of the second hearing aid (1b). (Col 4, lines 56-60)

6. As to claim 10, Baechler and Allegro remain as applied above. Baechler further discloses that the environment classifier of each of the first and second hearing aids is configured to communicate wirelessly. (Col. 2, lines 61-64)

7. As to claim 11, Baechler and Allegro remain as applied above. Baechler does not explicitly disclose that the first output and the second output are in digital form. Baechler

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is silent as to whether or not the system is digital or analog. Examiner takes official notice that an a digital control signal would have been necessary to implement signal processing as taught by Baechler on a digital system. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention to provide a control signal from the first and second output in digital form.

8. As to claim 12, Baechler and Allegro remain as applied above. It is noted that Baechler and Allegro do not mention a specific time interval for data communication between the first and second hearing aids, although Baechler teaches that an optimal value can be selected for the interval. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention, to select any optimal value for the interval between data communication between the first and second hearing aids, including at least 250 ms.

9. As to claim 13, Baechler and Allegro remain as applied above. Allegro further teaches that the environment classifier of either the first or the second hearing aid is configured to categorize the sound environment as an environment class selected from the group consisting of speech, babble speech, restaurant clatter, music and traffic noise. (Col. 4, lines 29-31).

10. As to claim 14, Baechler and Allegro remain as applied above. Allegro further discloses that the first output of the environment classifier of the first hearing aid

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comprises a plurality of values corresponding to probabilities of sound belonging to different environment classes. (The classifier uses fuzzy logic; Col 3, lines 39-42).

11. As to claim 15, Baechler and Allegro remain as applied above, Allegro further teaches that the first output of the environment classifier of the first hearing aid corresponds to a selection of an environment class from a plurality of environment classes. (Col. 4, lines 29-31).

12. As to claim 16, Baechler and Allegro remain as applied above. Baechler and Allegro do not specifically teach that the first or second input comprises information regarding a time interval between two events of data transmission, although Baechler teaches an time interval between transmissions. Examiner takes official notice that it was well known to include timing data in a control signal, especially when dealing with synchronization. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention, to include information regarding the interval in either the first or second input.

13. As to claim 17, Baechler and Allegro remain as applied above. Baechler and Allegro are not specific as to the functions performed by signal processor 5, as Baechler is directed to binaural synchronization, and Allegro is directed to classifying a sound environment. However Baechler does not limit the parameters controlled by signal processor. Examiner takes official notice that signal processors capable of controlling a parameter of a sound signal was well known in the art. Therefore it would have been

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obvious to one of ordinary skill, at the time of Applicant's invention, to configure the parameter map of the hearing aids to control any one of: an amount of noise reduction, an amount of broadband gain, an amount of frequency specific gain, a corner frequency of a frequency selective filter, a slope of a frequency selective filter, a knee-point of an AGC algorithm, a compression ratio of an AGC algorithm, and a directionality of a microphone.

14. As to claim 18, Baechler discloses a binaural hearing aid system (Figs 1-3) having a first hearing aid (1a), comprising a microphone (3a), a processor (5a) that is configured to process the signals in accordance with a predetermined signal processing algorithm to generate a processed output signal, and an output transducer (7a) for conversion of the processed output signal to an acoustic output signal; and a parameter map (20) for provision of an output for a selection of the signal processing algorithm, wherein the parameter map is configured to receive a first output from the environment classifier (23) and a second output from an environment classifier of a second hearing aid (The hearing aid classifier output in the second hearing aid is received via 27, and is represented by 25), and generate the output for the selection of the signal processing algorithm.

It is noted that Baechler does not explicitly disclose an A/D converter for provision of a digital signal in response to a sound signal received at the microphone in a sound environment surrounding a user of the binaural hearing aid system as well as a D/A converter. Baechler is silent as to whether or not the system is digital or analog.



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Examiner takes official notice that an A/D and a D/A converter would have been necessary to implement signal processing as taught by Baechler on a digital system. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention to provide both an A/D and D/A converters in the hearing aid system taught by Baechler.

It is also noted that Baechler does not explicitly teach that the sound environment detector has a feature extractor for determination of characteristic parameters of the received sound signals. However, using a feature extractor would have been well known in the art. Allegro teaches a sound environment detector (Fig. 1) utilizing a feature extractor (F) for determination of characteristic parameters of the received sound signals. Therefore, it would have been obvious to one of ordinary skill in the art, at the time of Applicant's invention to provide a feature extractor in the hearing aid system disclosed by Baechler, to provide a robust and precise classification of the sound environment (Allegro: Col. 2, lines 16-18).

15. As to claim 19, Baechler and Allegro remain as applied above. Baechler further discloses that the first output corresponds with an environment classification determined by the environment classifier of the first hearing aid (1a), and the second output corresponds with an environment classification determined by the environment classifier of the second hearing aid (1b). (Col 4, lines 56-60)

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16. As to claim 20, Baechler and Allegro remain as applied above. Baechler further teaches that the environment classifier of the first hearing aid is configured to communicate wirelessly to a parameter map of the second hearing aid. (Col. 2, lines 61-64).

17. As to claim 21, Baechler and Allegro remain as applied above. Baechler does not explicitly disclose that the first output and the second output are in digital form. Baechler is silent as to whether or not the system is digital or analog. Examiner takes official notice that an a digital control signal would have been necessary to implement signal processing as taught by Baechler on a digital system. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention to provide a control signal from the first and second output in digital form.

18. As to claim 22, Baechler and Allegro remain as applied above. It is noted that Baechler and Allegro do not mention a specific time interval for data communication between the first and second hearing aids, although Baechler teaches that an optimal value can be selected for the interval. Therefore, it would have been obvious to one of ordinary skill, at the time of Applicant's invention, to select any optimal value for the interval between data communication between the first and second hearing aids, including at least 250 ms.

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19. As to claim 23, Baechler and Allegro remain as applied above. Allegro further teaches that the environment classifier of either the first or the second hearing aid is configured to categorize the sound environment as an environment class selected from the group consisting of speech, babble speech, restaurant clatter, music and traffic noise. (Col. 4, lines 29-31).

20. As to claim 24, Baechler and Allegro remain as applied above. Allegro further discloses that the first output of the environment classifier of the first hearing aid comprises a plurality of values corresponding to probabilities of sound belonging to different environment classes. (The classifier uses fuzzy logic; Col 3, lines 39-42).

21. As to claim 25, Baechler and Allegro remain as applied above, Allegro further teaches that the first output of the environment classifier of the first hearing aid corresponds to a selection of an environment class from a plurality of environment classes. (Col. 4, lines 29-31).

22. As to claim 26, Baechler and Allegro remain as applied above. Baechler and Allegro do not specifically teach that the first or second input comprises information regarding a time interval between two events of data transmission, although Baechler teaches an time interval between transmissions. Examiner takes official notice that it was well known to include timing data in a control signal, especially when dealing with synchronization. Therefore, it would have been obvious to one of ordinary skill, at the

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time of Applicant's invention, to include information regarding the interval in either the first or second input.

23. As to claim 27, Baechler and Allegro remain as applied above. Baechler and Allegro are not specific as to the functions performed by signal processor 5, as Baechler is directed to binaural synchronization, and Allegro is directed to classifying a sound environment. However Baechler does not limit the parameters controlled by signal processor. Examiner takes official notice that signal processors capable of controlling a parameter of a sound signal was well known in the art. Therefore it would have been obvious to one of ordinary skill, at the time of Applicant's invention, to configure the parameter map of the hearing aids to control any one of: an amount of noise reduction, an amount of broadband gain, an amount of frequency specific gain, a corner frequency of a frequency selective filter, a slope of a frequency selective filter, a knee-point of an AGC algorithm, a compression ratio of an AGC algorithm, and a directionality of a microphone.

24. As to claim 28, Baechler and Allegro remain as applied above. Baechler further discloses a second hearing aid (1b).

### ***Response to Arguments***

25. Applicant's arguments with respect to claim 1 have been considered, but are moot in view of the new ground(s) of rejection.

***Conclusion***

The prior art made of record

- a. US Patent Number 6,768,802
- b. US Patent Number 7,158,931

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan C. Robinson whose telephone number is (571) 270-3956. The examiner can normally be reached on Monday through Friday from 9 am to 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/R. C. R./

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/CURTIS KUNTZ/

Supervisory Patent Examiner, Art Unit 2614